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10/076,141	02/15/2002	Wayne E. Conrad	88630.213CIP	9852
7590	07/24/2008		EXAMINER	
Henry N. Wixon Hale and Dorr LLP Suite 1000 1455 Pennsylvania Avenue, NW Washington, DC 22201			CHORBALI, MONZER R	
			ART UNIT	PAPER NUMBER
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			07/24/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/076,141	<b>Applicant(s)</b> CONRAD ET AL.
	<b>Examiner</b> MONZER R. CHORBAJI	<b>Art Unit</b> 1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 09 October 2007.  
 2a) This action is FINAL.      2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1-16 and 18-21 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-16 and 18-21 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 15 February 2002 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_

## DETAILED ACTION

**This final action is in response to the arguments received on 10/9/07**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1-2, 12, 15-16 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118).

Regarding claim 1, Meston discloses a container (figure 5:1) having the following: two sides with space in between (figure 5:5 and 7), two inlets for a first and second fluid (figure 5:18 and 21), first baffle (figure 5:13) is inclining upwardly and extending from the first side (figure 5:7) toward the second side (figure 5:5) thereby forming a first gap between the first baffle and the second side and an outlet (figure 5:28). As to the limitation that the first baffle is inclining upwardly from the first side toward the second side at a first angle between 22.5 and 27.5 degrees, the disclosure as a whole does not provide any criticality regarding the range for angles. See pages 2-3, where any angle value meets the requirements of the invention as long as it forms eddies and that the value of the angle depends on the velocities of the fluid to be contacted and also depends on the rate of flow of the fluid to be introduced. The Meston apparatus, including the different angles of the baffles, is designed for placement on a mobile unit as explained in column 5, lines 29-60. Meston teaches in column 5, a critical angle range. This teaching is based on the fact that the Meston apparatus is designed for mobility purposes. Furthermore, Meston teaches in column 5, that the number and angles of the baffles depend on the height of the contacting chamber. One of ordinary skill in the art wanting to design a non-portable mixing device would realize based upon the guidance of the Meston that the number of baffles as well as their angle range are to be modified for an apparatus not intended for loading on trucks and would also recognize based upon the Meston teachings that as the height of the contact chamber

is manipulated so does the number and angles of the baffles. Hence, since no criticality to upwardly inclination angles is taught in the instant disclosure, and the prior art encompasses the newly added angle range, determining the proper range of the upwardly inclined angles is a matter of routine experimentation. See MPEP 2144.05 II.

Regarding claim 2, Meston discloses a second baffle (figure 5:12) extending from the second side (figure 5:5) toward the first side (figure 5:7) forming a second gap between the second baffle and the first side, and inclining upwardly at a second angle (unlabeled upwardly inclining second angle of the second baffle with the horizontal axis 12 in figure 5).

Regarding claim 12, Meston's second baffle (figure 5:12) extends across 80% of the width (unlabeled space between first side 7 and second side 5 in figure 5) of the chamber.

Regarding claims 15-16, Meston discloses the following: an inlet (figure 5:18) and an outlet (figure 5:28) for each of the first fluid and the second fluid, the first fluid (first fluid is flowing downwardly in inlet 18 within container 1 in figure 5) being introduced to the chamber to flow counter to the flow of the second fluid (second fluid is flowing upwardly through liquid inlet 21 in figure 5) and the directing means (figure 5:13) defines a serpentine flow path (bubbles exiting discharge openings 20 in figure 5 flows around baffles 12 and 13 in a serpentine path) through the chamber.

As to the different first and second angle values recited in claims 18-20, the disclosure as a whole does not provide any criticality regarding the range for angles. See pages 2-3, where any angle value meets the requirements of the invention as long

as it forms eddies and that the value of the angle depends on the velocities of the fluid to be contacted and also depends on the rate of flow of the fluid to be introduced. The Meston apparatus, including the different angles of the baffles, is designed for placement on a mobile unit as explained in column 5, lines 29-60. Meston teaches in column 5, a critical angle range. This teaching is based on the fact that Meston apparatus is designed for mobility purposes. Furthermore, Meston teaches in column 5, that the number and angles of the baffles depend on the height of the contacting chamber. One of ordinary skill in the art wanting to design a non-portable mixing device would realize based upon the Meston guidance that the number of baffles as well as their angle range are to be modified for an apparatus not intended for loading on trucks and would also recognize based upon Meston teachings that as the height of the contact chamber is manipulated so does the number and angles of the baffles. Hence, since no criticality to upwardly inclination angles is taught in the instant disclosure, and the prior art encompasses such angle values, determining the proper range of the upwardly inclined angles is a matter of routine experimentation. See MPEP 2144.05 II.

Regarding claim 21, Meston teaches (col.5, lines 49-54) that the number and angles of the baffles depend on the height of the contacting chamber and that more than two inclined baffles are used. Based on these teachings, a third gap defining a truncated triangular cross-section is formed between an adjacent pair of the first baffle (figure 5:13), the second baffle (figure 5:12) and the third baffle.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118) as applied to claim 1 and further in view of Burgher (U.S.P.N. 5,091,118).

Meston is silent regarding the use of a venturi tube. Burgher injects gases into liquids and teaches the use of venturi (30). As result, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the device in Meston with a venturi tube because adding venturi means maximizes the concentration of the gas in the liquid as taught by Burgher (col.1, lines 61-64).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118) as applied to claim 1 and further in view of Smith et al (U.S.P.N. 5,730,784).

Meston uses scrubbing solution (col.4, lines 24-26) to scrub hydrogen sulfide gas (col.1, lines 5-7), but does not specifically teach placing a catalyst in his container. Smith scrubs hydrogen sulfide gas with a liquid catalyst-containing medium (col.10, lines 31-35) in order to remove hydrogen sulfide by chemically converting it to insoluble sulfur particles (col.9, lines 64-67). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the container in Meston with a catalyst in order to remove hydrogen sulfide by chemically converting it to insoluble sulfur particles as taught by Smith (col.9, lines 64-67).

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118) as applied to claim 1 and further in view of Kehse (U.S.P.N. 3,497,327).

Meston scrubs hydrogen sulfide gas (col.1, lines 5-7) by injecting it into a scrubbing solution (col.4, lines 24-26) where upwardly inclined baffles insure good contact between the liquid and the gas through a tortuous path. Meston does not specifically disclose any structural elements present on the surface of his baffles. Kehse injects hydrogen gas (col.5, lines 54-56) through, for example, fresh oil (col.4, lines 43-45) where guide means (figure 2:28) are positioned on upper surfaces of perforated baffles (figure 1:10) in order to force the liquid to flow along the surfaces of the baffles in tortuous paths (col.6, lines 62-66) and achieve intimate mixing of the fluids. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the chamber in Meston with the guide means in order to force the liquid to flow along the surfaces of the baffles in tortuous paths, thereby achieving intimate mixing of the fluids as taught by Kehse (col.6, lines 62-66).

8. Claims 6-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118) as applied to claim 2 and further in view of Eng et al (U.S.P.N. 3,494,099).

Regarding claims 6-7, Meston does not specifically teach the use of chemical modification structures such as ultrasonic emitters in his chamber. Eng removes sulfur from contaminated gases by flowing gas through a chamber (figure 1:10) that includes ultrasonic emitters (figure 1:34) for vibrating the scrubbing liquid/water. The vibrating chemically activated water droplets absorb sulfur and carbon gases (col.6, lines 12-17). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the chamber in Meston with ultrasonic emitters because

the vibrating chemically activated water droplets absorb sulfur and carbon gases as taught by Eng (col.6, lines 12-17).

9. Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118) in view of Eng et al (U.S.P.N. 3,494,099) as applied to claim 6 and further in view of Cox et al (U.S.P.N. 5,017,203).

Regarding claim 8, both Meston and Eng do not specifically disclose placing UV source in their chambers. Cox scrubs polluted air with a scrubbing liquid (col.1, lines 18-22) and places UV generator (figure 2:12 and 1) within the contact chamber to promote polymerization of vaporous pollutants for converting them into solid particulate form (col.3, lines 7-9). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the chamber in Meston with a UV generator because ultraviolet light promotes polymerization of vaporous pollutants for converting them into solid particulate form as taught by Cox, thereby improving removal of the pollutants (col.3, lines 7-9).

Regarding claim 9, Meston discloses a container (figure 5:1) having baffles (figure 5:13 and 12) that are inclining upwardly. Meston does not specifically teach the use of ultrasonic emitters in his chamber. Furthermore, Meston teaches (col.5, lines 49-54) that the number and angles of the baffles depend on the height of the contacting chamber and that more than two inclined baffles are used. Eng removes sulfur from contaminated gases by flowing gas through a chamber (figure 1:10) that includes ultrasonic emitters (figure 1:34) for vibrating the scrubbing liquid/water. The vibrating chemically activated water droplets absorb sulfur and carbon gases (col.6, lines 12-17).

Placing the ultrasonic emitters of Eng into the Meston chamber result, in having the emitters being disposed at an angle relative to the upwardly inclined baffles of Meston where ultrasonic waves are directed through eddies in Meston contact chamber. Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the chamber in Meston with ultrasonic emitters because the vibrating chemically activated water droplets absorb sulfur and carbon gases as taught by Eng (col.6, lines 12-17).

**10.** Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118) in view of Smith et al (U.S.P.N. 5,730,784) as applied to claim 4 and further in view of Dorr et al (U.S.P.N. 5,030,428).

Regarding claim 10, Meston uses scrubbing solution (col.4, lines 24-26) to scrub hydrogen sulfide gas (col.1, lines 5-7), but does not specifically teach placing a catalyst in his container. Smith scrubs hydrogen sulfide gas with a liquid catalyst-containing medium (col.10, lines 31-35), but does not specifically teach using titanium dioxide. Dorr scrubs gases contaminated with sulfur and nitrogen compounds by using titanium dioxide (col.3, lines 12-19) in order to catalytically remove the sulfur and the nitrogen contaminants from the gas (col.3, lines 22-26). As a result, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the chamber in Meston with titanium dioxide in order to catalytically remove the sulfur and the nitrogen contaminants from the gas as taught by Dorr (col.3, lines 22-26).

Regarding claim 11, Meston discloses inlets (figure 5:20) at a lower portion of the container (figure 5:1).

11. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meston (U.S.P.N. 4,933,118) in view of Burgher (U.S.P.N. 5,091,118) as applied to claim 3 and further in view of Hebert (U.S.P.N. 2,888,140).

Regarding claims 13-14, Meston and Burgher do not specifically teach having removable insert that support at least one baffle where the insert fits within the container and is distanced from the container to provide a fluid flow between the container and the insert. Hebert discloses a removable insert (figure 4:40) that support at least one baffle (figure 4:47) where the insert fits within the container (figure 2:9 and 40) and is distanced (figure 4:44 and 45) from the container to provide a fluid flow between the container and the insert in order to facilitate cleaning (col.5, lines 49-50). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the chamber in Meston with removable insert supporting baffles in order to facilitate cleaning as taught by Hebert (col.5, lines 49-50).

***Response to Arguments***

12. Applicant's arguments filed on 10/9/07 have been considered but are not persuasive.

On pages 2-4 of the Remarks; Applicant argues that Appellants need not show criticality where the art of record teaches completely away from the limitations of the claimed invention; that Meston specifically teaches away from higher baffle angles, because the retention time of the gas in the apparatus will be too low; that the Meston apparatus would not operate effectively for its intended purpose if modified to the higher baffle angles claimed by Appellants; that fairly read, the teachings of Meston would

have suggested to one of ordinary skill in the art that baffle angles must be kept low to achieve adequate gas retention time, and that higher baffle angles would defeat this objective; that Meston teaches the person of ordinary skill away from higher angle baffles because high angles would increase the height of Meston's apparatus, making it impractical for its intended mobile use; that the examiner cites to no support in the art of record for the contention that one of ordinary skill in the art would want to design a non-portable mixing device since Meston criticizes non-portable systems as bulky, permanent structures and not suitable for small scale operations; and that there is no advantage to take small and portable apparatus as taught by Meston and make it bigger and non-portable.

Meston teaches that his apparatus can be used in stationary or mobile environments (col.6, lines 10-12) and that when used in mobile applications, the apparatus should have relatively small dimensions (col.1, lines 20-21) where one of ordinary skill in the art wanting to design a non-portable mixing device would realize based upon Meston guidance that the number of baffles as well as their angle ranges are to be modified (made larger than the disclosed range) for an apparatus intended to be not loaded on trucks and would also recognize based upon Meston teachings that as the height of the contact chamber is manipulated so does the number and angles of the baffles. As such determining the proper range of the upwardly inclined angles is considered well within the purview of the skilled artisan as a matter of routine experimentation. Only the expected results are obtained.

Applicant is also reminded that portable need not necessarily equate with small.

Anything is portable, given the right moving equipment.

Additionally, the disclosure as a whole does not provide any criticality regarding ranges for angles. See pages 2-3, where that any angle value meets the requirements of the invention as long as it forms eddies and the value of the angle depends on the velocities of the fluid to be contacted and the rate of flow of the fluid to be introduced. Meston gives specific teaching to one of ordinary skill in the art on the adjustment of baffle angle. See column 5, lines 32-50. These teachings would encourage one of ordinary skill in the art to experiment on baffle angle until achieving the optimum contact time for a given application. One of ordinary skill in the art upon reading the disclosure would realize determining the desired angle values is a matter of routine experimentation due to lack of teaching unexpected results with certain critical angle values.

#### *Conclusion*

**13. THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

**14.** A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date

of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MONZER R. CHORBAJI whose telephone number is (571)272-1271. The examiner can normally be reached on M-F 9:00-5:30.

16. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571) 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

17. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. R. C./

/Jill Warden/  
Supervisory Patent Examiner, Art Unit 1797